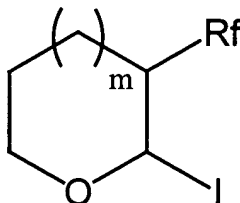


WHAT IS CLAIMED IS:

1. A method of increasing the fluorous nature of a compound, including the step of reacting the compound with at least one second compound having the formula:



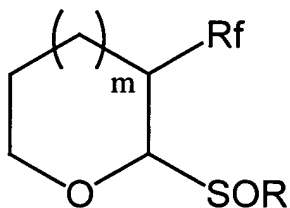
wherein Rf is a fluorous group and m is 0, 1 or 2.

2. The method of Claim 1 wherein Rf is a perfluoroalkyl group.

3. The method of Claim 2 wherein Rf is $-C_nF_{2n+1}$ wherein n is an integer in the range of 4 to 32.

4. The method of Claim 1 wherein Rf is a perfluoroadamantyl group.

5. A method of increasing the fluorous nature of a compound, including the step of reacting the compound with at least one second compound having the formula:



wherein Rf is a fluororous group, R¹ is a an alkyl group or an aryl group and m is 0, 1 or 2.

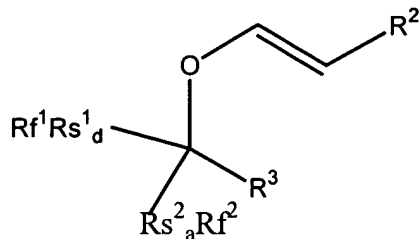
6. The method of Claim 5 wherein Rf is a perfluoroalkyl group.

7. The method of Claim 6 wherein Rf is -C_nF_{2n+1} wherein n is an integer in the range of 4 to 32.

8. The method of Claim 5 wherein Rf is a perfluoroadamantyl group.

9. The method of Claim 5 wherein R¹ is a phenyl group.

10. A method of increasing the fluororous nature of a compound, including the step of reacting the compound with at least one second compound having the formula:



wherein Rf^1 and Rf^2 are independently, the same or different, fluorous groups, Rs^1 is a spacer group, d is 1 or 0, Rs^2 is a spacer group, a is 1 or 0, R^2 is a H, an alkyl group or an aryl group, R^3 is H or $-Rs^3_eRf^3$, wherein, Rs^3 is a spacer group, e is 1 or 0, and Rf^3 is a fluorous group.

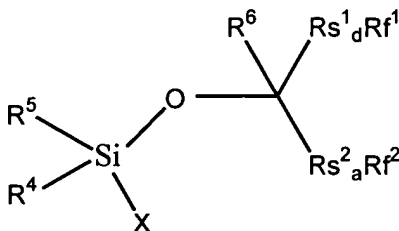
11. The method of Claim 10 wherein Rf^1 and Rf^2 are independently perfluoroalkyl groups.

12. The method of Claim 11 wherein the perfluoroalkyl groups have the formula $-C_nF_{2n+1}$ wherein n is an integer in the range of 4 to 32.

13. The method of Claim 10 wherein at least one of Rf^1 and Rf^2 is a perfluoroadamantyl group.

14. The method of Claim 10 wherein R^2 is H and R^3 is H.

15. A method of increasing the fluorous nature of a compound, including the step of reacting the compound with at least one second compound having the formula:



wherein Rf^1 and Rf^2 are independently, the same or different, fluororous groups, Rs^1 is a spacer group, d is 1 or 0, Rs^2 is a spacer group, a is 1 or 0,, R^4 is an alkyl group or an aryl group, R^5 is an alkyl group or an aryl group, R^6 is H, an alkyl group, or a fluorinated alkyl group, and X is Cl, Br or I.

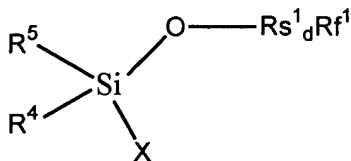
16. The method of Claim 15 wherein Rf^1 and Rf^2 are independently perfluoroalkyl groups.

17. The method of Claim 16 wherein perfluoroalkyl groups have the formula $-\text{C}_n\text{F}_{2n+1}$ wherein n is an integer in the range of 4 to 32.

18. The method of Claim 15 wherein at least one of Rf^1 and Rf^2 is a perfluoroadamantyl group.

19. The method of Claim 15 wherein R^5 is H.

20. A method of increasing the fluororous nature of a compound, including the step of reacting the compound with at least one second compound having the formula:



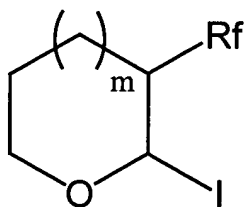
wherein Rf^1 is a fluororous group, Rs^1 is a spacer group, d is 1 or 0, R^4 is an alkyl group or an aryl group, R^5 is an alkyl group or an aryl group, and X is Cl, Br or I.

21. The method of Claim 20 wherein Rf^1 is a perfluoroalkyl group.

22. The method of Claim 21 wherein Rf^1 is $-C_nF_{2n+1}$ wherein n is an integer in the range of 4 to 32.

23. The method of Claim 20 wherein Rf^1 is a perfluoroadamantyl group.

24. A compound having the formula:



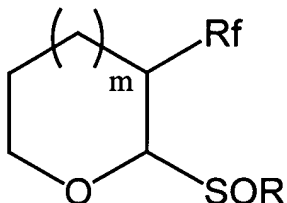
wherein Rf is a fluorohydrocarbon group, a perfluorocarbon group, a fluorinated ether group or a fluorinated amine group and m is 0, 1 or 2.

25. The compound of Claim 24 wherein Rf is a perfluoroalkyl group.

26. The compound of Claim 25 wherein Rf is $-C_nF_{2n+1}$ wherein n is an integer in the range of 4 to 32.

27. The compound of Claim 24 wherein Rf is a perfluoroadamantyl group.

28. A compound having the formula:



wherein Rf is a fluorohydrocarbon group, a perfluorocarbon group, a fluorinated ether group or a fluorinated amine group, R¹ is a an alkyl group or an aryl group and m is 0, 1 or 2.

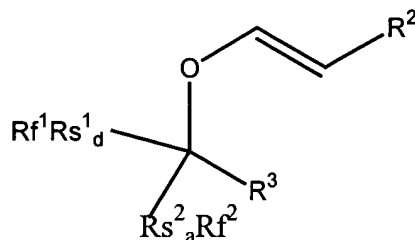
29. The compound of Claim 28 wherein Rf is a perfluoroalkyl group.

30. The compound of Claim 29 wherein Rf is $-C_nF_{2n+1}$ wherein n is an integer in the range of 4 to 32.

31. The compound of Claim 28 wherein Rf is a perfluoroadamantyl group.

32. The compound of Claim 28 wherein R¹ is a phenyl group.

33. A compound having the formula:



wherein R^f_1 and R^f_2 are independently, the same or different, a fluorohydrocarbon group, a perfluorocarbon group, a fluorinated ether group or a fluorinated amine group, R^{s_1} is a spacer group selected from an alkylene group, a divalent phenyl group or an alkoxy alkylene group, d is 1 or 0, R^{s_2} is a spacer group selected from an alkylene group, a divalent phenyl group or an alkoxy alkylene group, a is 1 or 0, R^2 is a H, an alkyl group or an aryl group, R^3 is H or $-R^{s_3}_e R^f_3$, wherein, R^{s_3} is a spacer group of an alkylene group, a divalent phenyl group or an alkoxy alkylene group, e is 1 or 0, and R^f_3 is a fluorohydrocarbon group, a perfluorocarbon group, a fluorinated ether group or a fluorinated amine group.

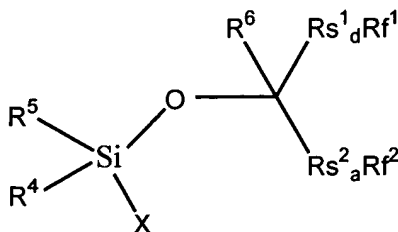
34. The compound of Claim 33 wherein R^f_1 and R^f_2 are independently perfluoroalkyl groups.

35. The compound of Claim 34 wherein the perfluoroalkyl groups have the formula $-C_n F_{2n+1}$ wherein n is an integer in the range of 4 to 32.

36. The compound of Claim 33 wherein at least one of R^f_1 and R^f_2 is a perfluoroadamantyl group.

37. The compound of Claim 33 wherein R^2 is H and R^3 is H.

38. A compound having the formula:



wherein Rf^1 and Rf^2 are independently, the same or different, a fluorohydrocarbon group, a perfluorocarbon group, a fluorinated ether group or a fluorinated amine group, Rs^1 is a spacer group selected from an alkylene group, a divalent phenyl group or an alkoxy alkylene group, d is 1 or 0, Rs^2 is a spacer group selected from an alkylene group, a divalent phenyl group or an alkoxy alkylene group, a is 1 or 0, R^4 is an alkyl group or an aryl group, R^5 is an alkyl group or an aryl group, R^6 is H, an alkyl group, or a fluorinated alkyl group, and X is Cl, Br or I.

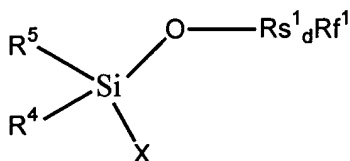
39. The compound of Claim 38 wherein Rf^1 and Rf^2 are independently perfluoroalkyl groups.

40. The compound of Claim 39 wherein the perfluoroalkyl groups have the formula $-\text{C}_n\text{F}_{2n+1}$ wherein n is an integer in the range of 4 to 32.

41. The compound of Claim 38 wherein at least one of Rf^1 and Rf^2 is a perfluoroadamantyl group.

42. The compound of Claim 38 wherein R^5 is H.

43. A compound having the formula:



wherein Rf^1 is a fluorohydrocarbon group, a perfluorocarbon group, a fluorinated ether group or a fluorinated amine group, Rs^1 is a spacer group selected from an alkylene group, a divalent phenyl group or an alkoxy alkylene group, d is 1 or 0, R^4 is an alkyl group or an aryl group, R^5 is an alkyl group or an aryl group, and X is Cl, Br or I.

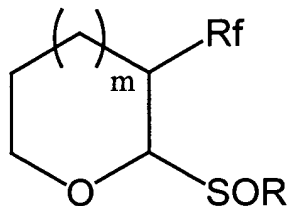
44. The compound of Claim 43 wherein Rf^1 is a perfluoroalkyl group.

45. The compound of Claim 44 wherein Rf^1 is $-C_nF_{2n+1}$ wherein n is an integer in the range of 4 to 32.

46. The compound of Claim 43 wherein Rf^1 is a perfluoroadamantyl group.

47. A method of activating an anomeric sulfoxide to react with an alcohol to form a corresponding ether comprising the step of mixing the anomeric sulfoxide with Cp_2ZrCl_2 , $AgClO_4$, and the alcohol.

48. The method of Claim 47 wherein the anomeric sulfoxide has the formula:



wherein Rf is a fluorine group, R¹ is an alkyl group or an aryl group and m is 0, 1 or 2.

49. A method of carrying out a reaction comprising the steps of:

attaching a fluorine tag to a substrate that is bound to a solid support;

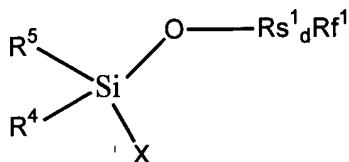
cleaving the fluorine-tagged substrate from the solid support while retaining the fluorine tag attached thereto;

reacting the cleaved fluorine-tagged substrate in a liquid phase reaction to synthesize a fluorine-tagged product; and

separating the fluorine-tagged product from other compounds using a fluorine separation technique.

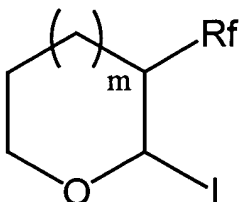
50. The method of Claim 49 further including the step of cleaving the fluorine tag from the fluorine-tagged product.

51. The method of Claim 50 wherein the fluororous tag has the formula:



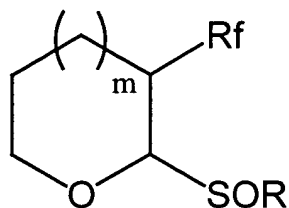
wherein Rf¹ is a fluorous group, Rs¹ is a spacer group, d is 1 or 0, R⁴ is an alkyl group or an aryl group, R⁵ is an alkyl group or an aryl group, and X is Cl, Br or I.

52. The method of Claim 50 wherein the fluororous tag has the formula:



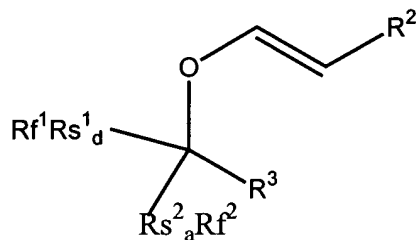
wherein Rf is a fluorous group and m is 0, 1 or 2.

53. The method of Claim 50 wherein the fluororous tag has the formula:



wherein R_f is a fluorine group, R^1 is an alkyl group or an aryl group and m is 0, 1 or 2.

54. The method of Claim 50 wherein the fluorine tag has the formula:



wherein R_f^1 and R_f^2 are independently, the same or different, fluorine groups, Rs^1 is a spacer group, d is 1 or 0, Rs^2 is a spacer group, a is 1 or 0, R^2 is a H, an alkyl group or an aryl group, R^3 is H or $-Rs^3_e R_f^3$, wherein, Rs^3 is a spacer group, e is 1 or 0, and R_f^3 is a fluorine group.